L 43708-66

ACC NR: AP6023670

that will provide a maximum to the functional

$$Q = \|f(t) - f_*(t)\|^2 L^2 = \int_{t_0}^{t_1} [f(t) - f^*(t)]^2 \, dt.$$

Simulation arrangements are given for the problem of approximating f(t) with systems of Legendre and Laguerre polynomials. Orig. art. has: 4 figures and 7 formulas.

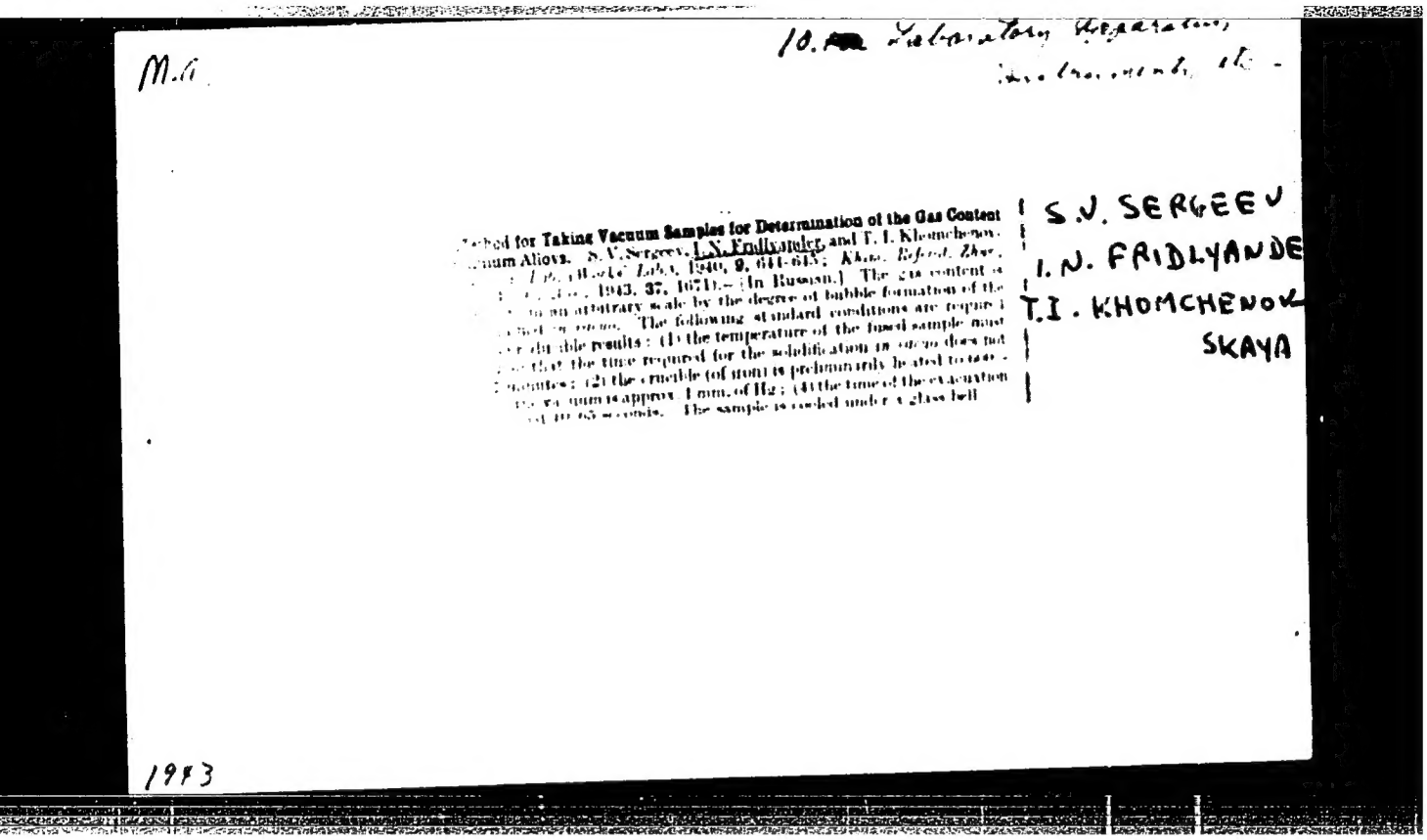
SUB CODE: 09,12/ SUBM DATE: 12Oct65/ ORIG REF: 001

Card 2/2

PALTARAK, M.N.; FRIDLYAND, Ye.I., sanitarnyy vrach

Hygienic improvements at the Minsk Tractor Factory. Zdrav. Belor. 5 no.11:48-49 N '59. (MIRA 13:2)

1. Glavnyy vrach medsanchasti Minskogo traktornogo zavoda (for Paltarak).
(MINSK--TRACTOR INDUSTRY--HYGIENIC ASPECTS)



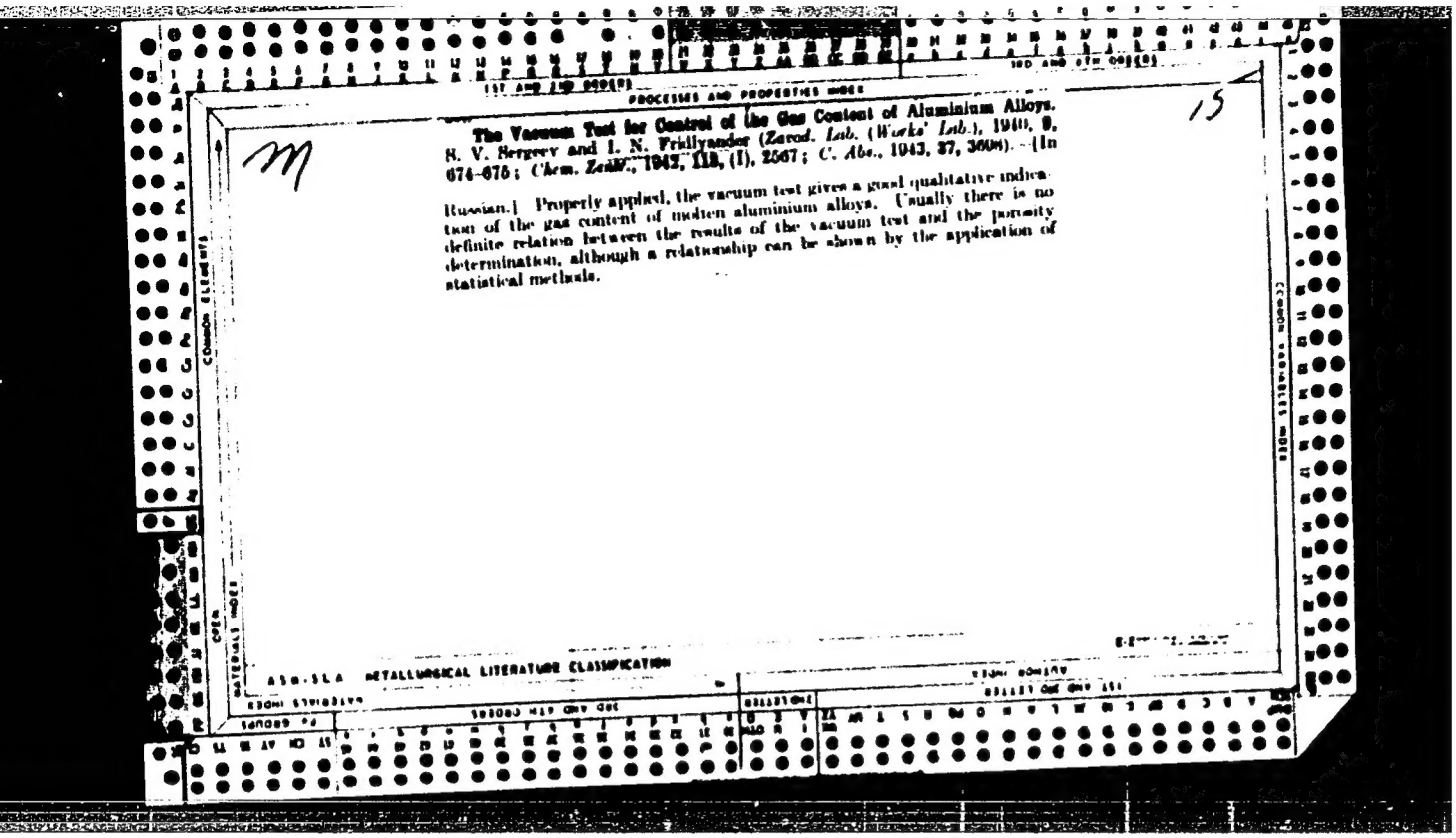
M.G.

10. Laboratory Apparatus

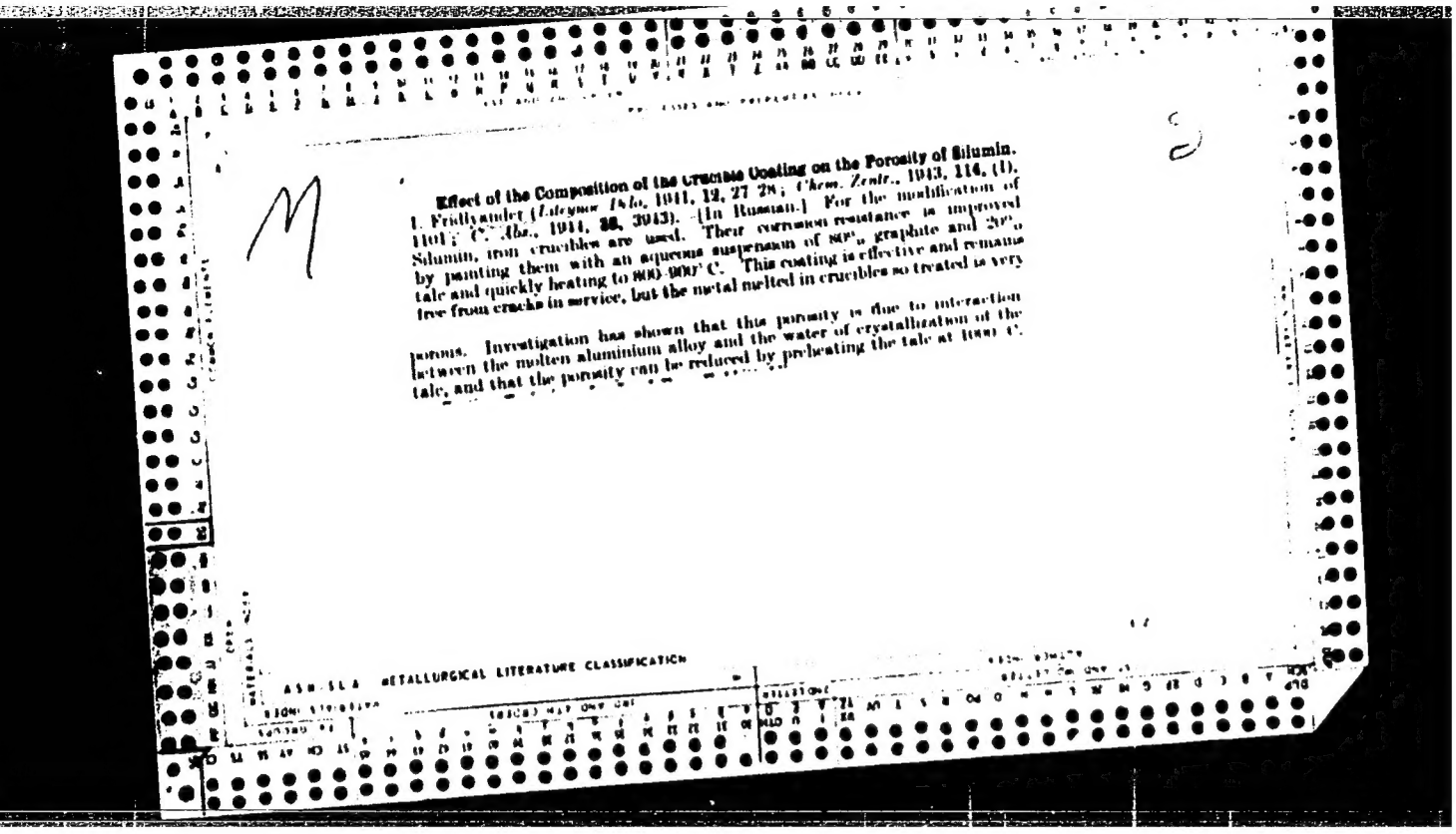
...ked for Taking Vacuum Samples for Determination of the Gas Content ...num Alloys. S. V. Sergeev, I. N. Fridlyander, and T. I. Khomchenovskaya. ... Zavod. Lab., 1940, 9, 611-615; Abstr. Referat. Zhur. ... 1943, 37, 1071.—(In Russian.) The gas content ... on an arbitrary scale by the degree of bubble formation of the ... The following standard conditions are require ... ble results: (1) the temperature of the fused sample must ... that the time required for the solidification in vacuo does not ... ; (2) the crucible (of iron) is preliminarily heated to 600 ... ; (3) the vacuum is approx. 1 mm. of Hg; (4) the time of the evacuation ... seconds. The sample is cooled under a glass bell

S.V. SERGEEV
I.N. FRIDLYANDER
T.I. KHOMCHENOVSKAYA

1943



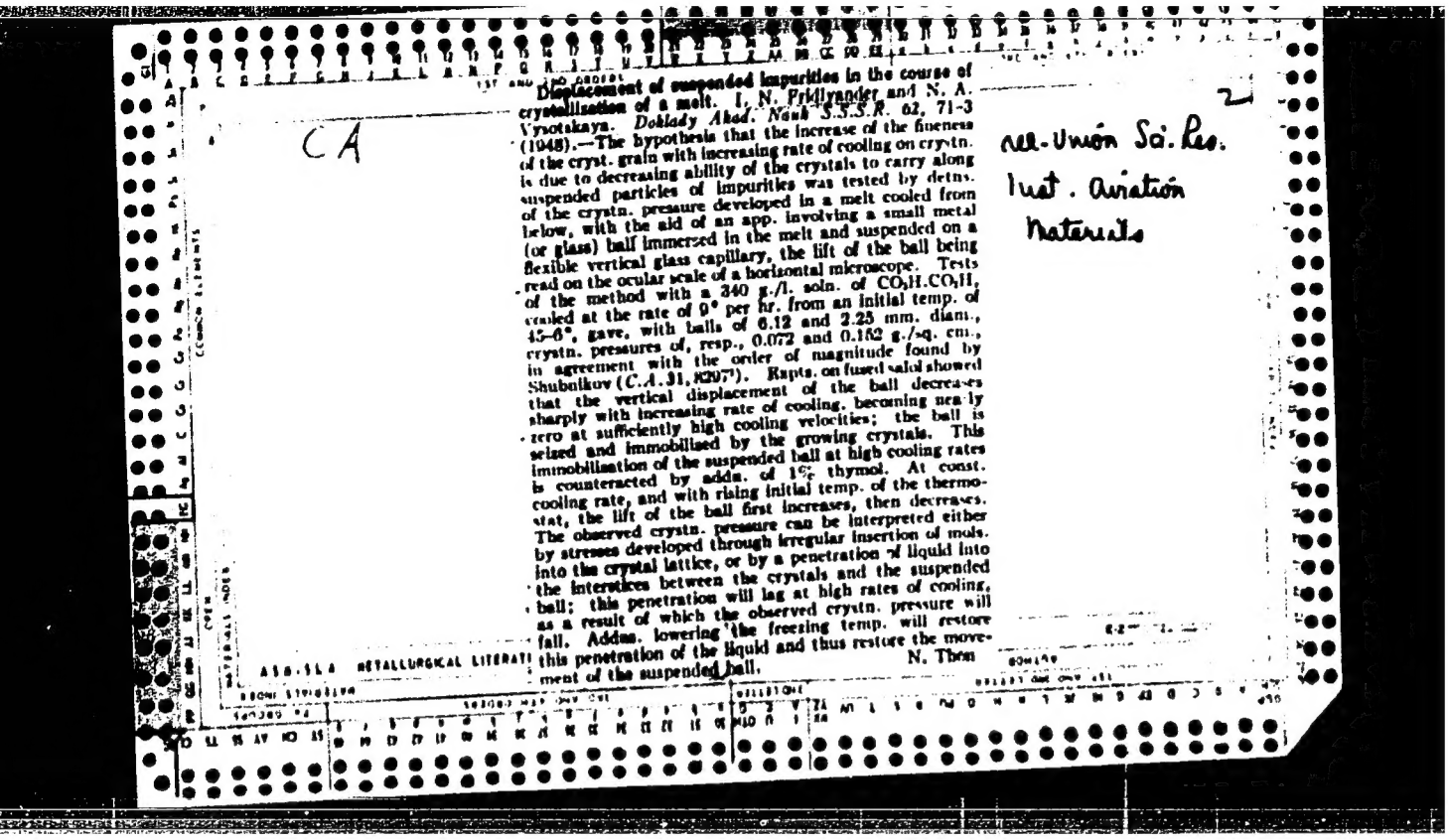
The Vacuum Test for Control of the Gas Content of Aluminium Alloys. S. V. Sergeev and I. N. Frillyander (*Zavod. Lab.* (*Works' Lab.*), 1940, **9**, 674–676; *Chem. Zentr.*, 1942, **113**, (I), 2567; *C. Abs.*, 1943, **37**, 3608). [In Russian.] Properly applied, the vacuum test gives a good qualitative indication of the gas content of molten aluminium alloys. Usually there is no definite relation between the results of the vacuum test and the porosity determination, although a relationship can be shown by the application of statistical methods.



Effect of the Composition of the Crucible Coating on the Porosity of Silumin.

I. Fridlyander (*Liteynoe Delo*, 1941, 12, 27–28; *Chem. Zentr.*, 1943, 114, (I), 1101; *C. Abs.*, 1944, **38**, 3943). [In Russian.] For the modification of Silumin, iron crucibles are used. Their corrosion resistance is improved by painting them with an aqueous suspension of 80% graphite and 20% talc and quickly heating to 800–900° C. This coating is effective and remains free from cracks in service, but the metal melted in crucibles so treated is very porous. Investigation has shown that this porosity is due to interaction between the molten aluminium alloy and the water of crystallization of the talc, and that the porosity can be reduced by preheating the talc at 1000° C.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

Displacement of suspended impurities in the course of crystallisation of a melt. I. N. Fridlyander and N. A. Vysotskaya. *Doklady Akad. Nauk S.S.S.R.* 62, 71-3 (1948).—The hypothesis that the increase of the fineness of the cryst. grain with increasing rate of cooling on crystn. is due to decreasing ability of the crystals to carry along suspended particles of impurities was tested by detns. of the crystn. pressure developed in a melt cooled from below, with the aid of an app. involving a small metal (or glass) ball immersed in the melt and suspended on a flexible vertical glass capillary, the lift of the ball being read on the ocular scale of a horizontal microscope. Tests of the method with a 340 g./l. soln. of $CO_2H.CO_2H$, cooled at the rate of 9° per hr. from an initial temp. of 45–6°, gave, with balls of 6.12 and 2.25 mm. diam., crystn. pressures of, resp., 0.072 and 0.162 g./sq. cm., in agreement with the order of magnitude found by Shubnikov (*C.A.* 31, 8297°). Expts. on fused salol showed that the vertical displacement of the ball decreases sharply with increasing rate of cooling, becoming nearly zero at sufficiently high cooling velocities; the ball is seized and immobilised by the growing crystals. This immobilisation of the suspended ball at high cooling rates is counteracted by addn. of 1% thymol. At const. cooling rate, and with rising initial temp. of the thermostat, the lift of the ball first increases, then decreases. The observed crystn. pressure can be interpreted either by stresses developed through irregular insertion of mols. into the crystal lattice, or by a penetration of liquid into the interstices between the crystals and the suspended ball; this penetration will lag at high rates of cooling, as a result of which the observed crystn. pressure will fall. Addns. lowering the freezing temp. will restore this penetration of the liquid and thus restore the movement of the suspended ball.

N. Thon

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Acad. Union Sci. Res. Inst. Aviation Materials

A58-5L4 METALLURGICAL LITERATURE

FRIDLYANDER, I. N., FILLIPOVA, Z. G., MODEL, M. S.

"Dependence of Temperature at Crystallization Threshold on Degree of Overcooling of the Fusion"
Izv. Sektora Fiz. Khim. Analiza IONKh AN SSSR, 22, 1953, pp 71-82

The temperature along the moving crystallization threshold in the overcooled liquid is studied. Basic measurements are processed in benzophenone. Experimental results show a sharp temperature jump of the thermocouple junction at the instant the moving crystallization threshold passes through. The phenomenon is ascribed to the release of latent heat. (RZhFiz, No 11, 1954)

SO: W-31187, 8 Mar 55

FRIDLYANDER, I.N.

3

✓ The possibility of formation of supersaturated solid solutions in aluminum alloys by quenching from the liquid state. I. N. Fridlyander. *Doklady Akad. Nauk S.S.S.R.* 104, [illegible]. Displacements in the solidus in the Al-Mn, Al-Mg, and Al-Cu alloys, found experimentally, and resulting from quenching, are shown in diagrams. Addnl. information is obtained from the study of the rapidly crystd. Al-Mn diagram. Quenching of the alloy from the solidus temp. lowered its specific resistivity (ρ), and its temp. coeff. (α) was increased. Moreover, the higher the quenching temp., the larger becomes α and the smaller ρ. The assumption is made, that a reduction of the crystn. pressure to some min. velocity of crystn. displaces completely the usual excess of atoms and their accumulation in accordance with the equil. state diagram. At still greater crystn. velocities, the excess of the atoms is no longer squeezed away, especially in alloys crystg. peritectically, and the excess of atoms becomes intercalated into the crystal lattice, distorting it, and creating new properties in it, or nonequil. modifications.

W. M. Steinberg

AL'TMAN, Morits Borisovich; LEBEDEV, Aleksandr Aleksandrovich; POLYANSKIY, Aleksey Pavlovich; CHUKHROV, Matvey Vasil'yevich; MIKHEYEVA, V.I., professor, doktor, retsenzent; KRYMOV, V.V., kandidat tekhnicheskikh nauk, retsenzent; FRIDLYANDER, I.N., kandidat tekhnicheskikh nauk, retsenzent; TELIS, M.Ya, inzhener, retsenzent; KRYSIN, B.T., retsenzetnt; LUZHNIKOV, L.P., redaktor; KAMAYEVA,O.M., redaktor izdatel'stva; ATTOPOVICH, M.K., tekhnicheskiy redaktor

[Melting and casting of light alloys] Plavka i lit'e legkikh splavov. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1956. 491 p. (MLRA 9:10)
(Alloys--Metallurgy)

FRIDLYANDER, Iosif Naumovich, kand. tekhn. nauk; KUTAYTSEVA, Yekaterina Ivanovna, kand. tekhn.nauk; UDAL'TSOV, A.N., glav. red.; AL'TMAN, M.B., kand. tekhn. nauk, red.

[High strength V95 aluminum alloy; system aluminum - magnesium - zinc - copper]Vysokoprochnyi aliuminevyi splav V95; sistemy aliuminii - magni - tsink- med'. Moskva, In-t tekhniko-ekon. informatsii, 1956. 61 p. (Informatsiia o nauchno-issledovatel'skikh rabotakh. Tema 6. No.I-56-34) (MIRA 16:3)

(Aluminum-magnesium-zinc alloys)

137-1958-3-4917

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 66 (USSR)

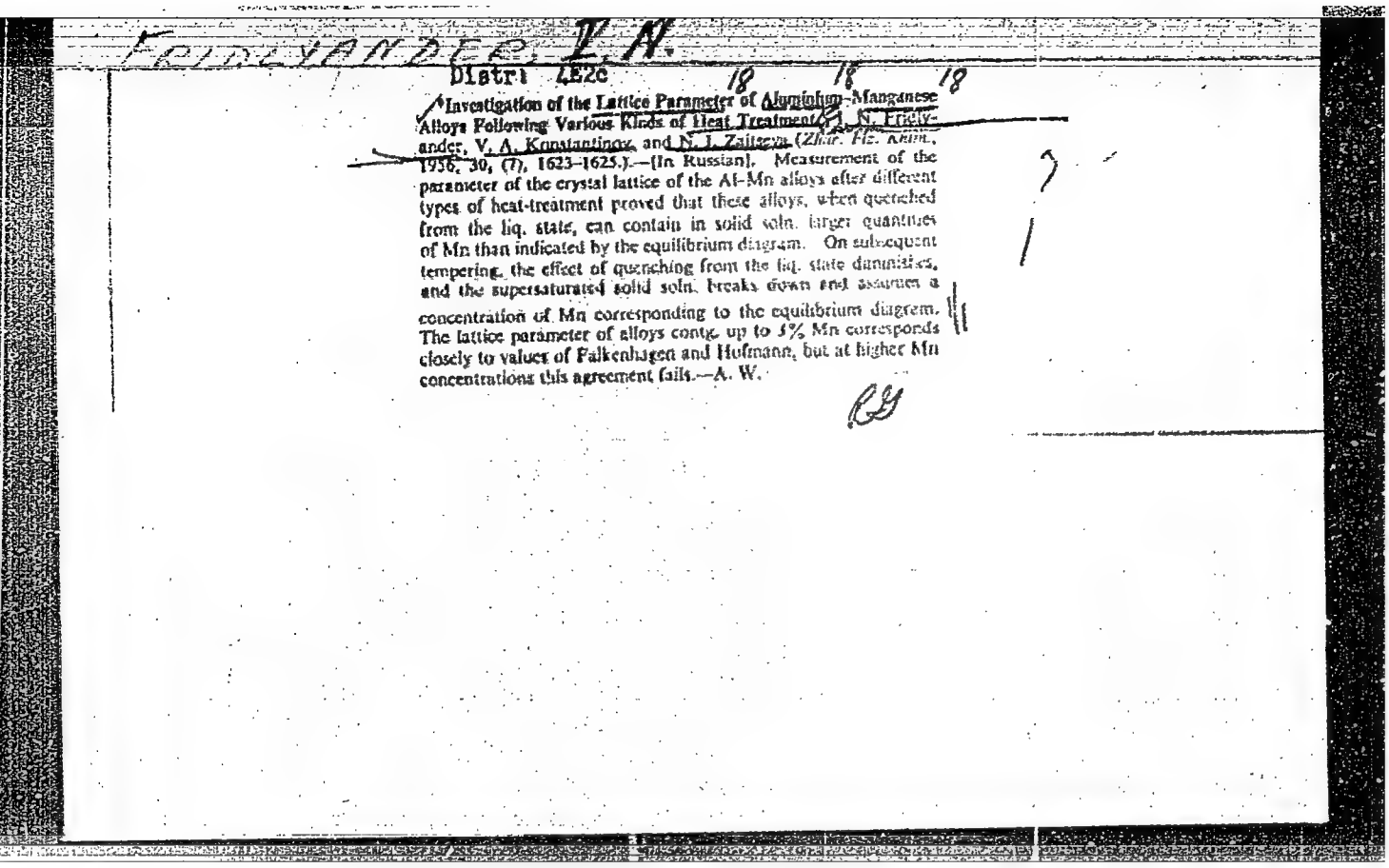
AUTHOR: Fridlyander, I. N.

TITLE: Investigation of Light-colored Crystallites in Aluminum Alloy Ingots Cast by the Method of Continuous Casting (Issledovaniye svetlykh kristallitov v slitkakh nepreryvnogo lit'ya iz alyuminiyevykh splavov)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov, Moscow, Oborongiz, 1957, pp 204-214 [Article originally appeared in Liteynoye proizvodstvo No. 10, 1956, pp 23-26.]

ABSTRACT: Bibliographic entry. Ref. RzhMet, 1958, Nr 2, 4916.

Card 1/1



FRIEDLANDER, V. N.

Distr: 4E2c 18 18 18

Investigation of the Lattice Parameter of Aluminium-Manganese Alloys Following Various Kinds of Heat Treatment. V. N. Friedlander, V. A. Konstantinov, and N. I. Zaitseva. (Zhur. Fiz. Khim., 1956, 30, (7), 1623–1625.)—[In Russian]. Measurement of the parameter of the crystal lattice of the Al-Mn alloys after different types of heat-treatment proved that these alloys, when quenched from the liq. state, can contain in solid soln. larger quantities of Mn than indicated by the equilibrium diagram. On subsequent tempering, the effect of quenching from the liq. state diminishes, and the supersaturated solid soln. breaks down and assumes a concentration of Mn corresponding to the equilibrium diagram. The lattice parameter of alloys contg. up to 5% Mn corresponds closely to values of Falkenhagen and Hofmann, but at higher Mn concentrations this agreement fails.—A. W.

RG

FRIDLYANDER, I.N.

Investigation of the oxide-type film inclusions in aluminum alloy stampings. I. N. Fridlyander. *Doklady AEad. Nauk S.S.S.R.* 70, 123–4 (1950).—Microstructure of inclusions in Al alloy stampings revealed that they were continuous films consisting of minute filaments and accretions in the metal, and not simple oxide films. They consisted of particles of strongly cold-hardened and superheated metal, with inclusions of oxide particles. Their formation could be prevented by greater metal purity with respect to oxide formation, by proper forging and stamping conditions which would prevent an excessive sliding of metal layers against each other, and by more normal pressure conditions.
W. M. Steinberg

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FRIDLYANDER, Iosif Naumovich, redaktor; CHUKHROV, Matvey Vasil'yevich, redaktor; IAGOVSKAYA, M.S., redaktor; ROZHIN, V.P., tekhnicheskiy redaktor

[Metallurgical principles of founding light alloys] Metallurgicheskie osnovy lit'ia legkikh splavov; sbornik statei. Moskva, Gos. izd-vo obor. promyshl., 1957. 442 p. (MLRA 10:7)
(Founding) (Alloys)

137-1958-2-2694

FRIDLYANDER, I. N.

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 71 (USSR)

AUTHORS: Fridlyander, I.N., Zahkarov, Ye.D., Podsechinov, A.V., Klyagina, N.S., Solov'yeva, V.V.

TITLE: Air-cooled and Water-cooled Round Ingots Cast From Alloy V95 (an Aircraft Aluminum Alloy) (Issledovaniye kruglykh slitkov splava V95, otlitykh s okhlazhdeniyem vodoy i vozdukhom)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 5-46

ABSTRACT: A study was made of the structure and properties of air-cooled and water-cooled cast round ingots (370 mm in diameter) and of sections obtained from them. Water cooling was found to enhance the quality and evenness of the mechanical properties and to reduce formation of liquation bands; on the other hand, water cooling would impair the corrosion resistance of the sections and intensify the formation of liquation burls on the ingots. Ingots of alloy V95 should be water-cooled.

G.S.

Card 1/1 1. Alloys--Ingots--Properties--Determination

S/564/57/000/000/013/029
D258/D307

AUTHOR: Fridlyander, I. N.

TITLE: Study of processes occurring during crystallization from the melt

SOURCE: Rost kristallov; doklady na Pervom soveshchanii po rostu kristallov, 1956 g. Moscow, Izd-vo AN SSSR, 1957, 178-189

TEXT: The author studied the effects of rapid cooling, such as is encountered during continuous casting, on Al alloys and on some transparent organic compounds to find what properties may be expected as a result of continuous casting, to define new possible methods of casting, and to study the effect of rapid crystallization on metallic structures. Fast cooling of Al alloys leads to finer, more closely spaced dendrites, finer inclusions of other phases, and hence to improved strength properties, reaching the strength of forged alloys, and to improved

Card 1/2

elongation. The plastic properties are, however, inferior to those of forged, heat-treated alloys. To ensure maximum rate of cooling and thus the optimum properties, the author recommends the use of an installation proposed by himself and V. G. Volovkin in which a thin sheet of metal is continuously cast on a moving water-cooled grid; this sheet may then be rolled without going through the ingot stage. Al-Mn alloys cast in this way possess unusually low electric resistance. For a wide range of supercooling, the temperature at the front of crystallization approaches the freezing point of the metal; metastable structures and new alloy properties may then be expected. There are 10 figures and 1 table.

Fridlyander, I. N.

137-1958-3-4918

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 66 (USSR)

AUTHORS: Fridlyander, I.N., Zakharov, Ye. D., Dronova, N. P., Solov'yeva, V. V., Petrova, A. A.

TITLE: An Investigation of Light-colored Crystallites in Aluminum Alloys D16 and V95 (Issledovaniye svetlykh kristallitov v alyuminiyevykh splavakh D16 i V95)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 215-228

ABSTRACT: The nature of the distribution of light-colored crystallites (LC), as well as their composition, was studied on ingots and on pressed components made of alloys D16 and V95; their effect on the mechanical properties of the alloy was investigated, also methods by which they can be eliminated. In ingots made of alloys D16 and V95, the LC are embedded in the central zone, whereas in components manufactured by pressing, their position varies. LC are seldom encountered in ingots 280 mm in diameter or less. In the D16 alloy the LC exhibit a lowered Cu and Mg content. The Cu content may decrease by 0.1 - 0.96 percent, the Mg content by 0.10 - 0.21 percent. The average values of the Cu and

...oy in ...operties of

G. S.

Card 1/2

FRIDLYANDER, I. N.

137-1958-2-2695

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 71 (USSR)

AUTHORS: Fridlyander, I.N., Zakharov, Ye.D., Dronova, N.P., Solov'yeva, V.V.

TITLE: The Mechanism of the Formation of Intermetallic Compounds in Ingots of Alloy V95 (an Aircraft Aluminum Alloy) (Issledovaniye mekhanizma poyavleniya intermetallidov v slitkakh iz splava V95)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 236-285

ABSTRACT: The basic cause of the formation of coarse Cr and Mn intermetallic compound inclusions in alloy V95 was found to be slow cooling during the crystallization process. When a melt was cooled slowly, the increase in the Cr and Mn concentrations and especially the addition of small quantities of Ti produced an enlargement of the intermetallic compound inclusions. Whether the melt was cooled rapidly or slowly, the formation of intermetallic compound inclusions was not affected by the composition of the original alloying element, by raising the temperature of the heat from 730 to 780°, or by increasing the exposure time of the molten metal at these temperatures from 1 to 5 hours. G.S.

Card 1/1

1. Alloys ingots--Applications 2. Compounds--Formation

FRIDLYANDER, I.N.

137-58-2-2901

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 99 (USSR)

AUTHOR: Fridlyander, I.N.

TITLE: A Study of the Nature of Oxide-scab-type Inclusions in Aluminum-alloy Forgings (Issledovaniye prirody vklyucheniy tipa okisnykh plen v shtampovkakh alyuminiyevykh splavov)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 286-288

ABSTRACT: Bibliographic entry. See RzhMet, 1957, Nr 1, Abstract 1442.

1. Aluminum alloy forgings--Impurities

Card 1/1

FRIDLYANDER, I.N.

137-58-2-2902

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 99 (USSR)

AUTHORS: Fridlyander, I.N., Zakharov, V.Z., Kashcheyev, M.G.

TITLE: A Study of Oxide Scab in Aluminum-alloy Forgings (Izucheniye okisnykh plen v shtampovkakh iz alyuminiyevykh splavov)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 298-305

ABSTRACT: A study was made of the causes of oxide-scab formation in aluminum-alloy forgings and of the relationship to scab formation of such factors as, a) the duration of the pouring operation, b) standing time in the holding furnace (mixer), c) forced mixing, d) the composition of the charge, e) filtration of the metal, and f) deformations. Data are given on oxide-scab distribution in individual forgings. It was demonstrated that the oxide scab is a result of a reaction of oxide casting scab with the metal in the process of being deformed. Some of it was related to the purity of the molten metal in the smelting furnace and to the rate at which scabs detached themselves from the stream surface while the metal was being poured. Filtration of the molten metal did not yield satisfactory results. The more oxide scabs there were

Card 1/2

137-58-2-2902

A Study of Oxide Scab in Aluminum-alloy Forgings

in the ingots and the greater was the degree of deformation, the greater were the size and number of scabs encountered in press-forgings and drop-forgings.
P.V.

1. Aluminum alloy forgings--Impurities

Card 2/2

137-58-4-6870

Translation from Referativnyy zhurnal, Metallurgiya, 1958 Nr 4, p 79 (USSR)

AUTHORS Kondrat'yev, N B , Fridlyander I N

TITLE: An Investigation of the Decomposition of a Solid Solution of Al-Cu-Mg-Mn Alloys Crystallizing at Various Rate of Cooling (Issledovaniye raspada tverdogo rastvora splavov sistemy Al-Cu-Mg-Mn, kristallizovavshikhsya s raznymi skorostyami okhlazhdeniya)

PERIODICAL: V sb. Metallurg. osnovy lit'ya splavov. Moscow, Oborongiz, 1957, pp 380-393

ABSTRACT: The effect of changes in the rates of crystallization of Al-Cu-Mg-Mn alloys having various amounts of Cu, Mg, and Mn upon the properties of alloys at room and elevated temperatures is investigated. An increase in the rate of crystallization of the alloys results in an increase in strength both at room and at elevated (150°C) temperature. The increase in the strength of alloys crystallizing at high speeds is due primarily to the difference in the properties of the solid solution and the nature of its breakdown. The difference in microhardness attains a maximum at 0.6% Mn content and declines when an alloy contains 0.2 and

Card 1/2

137-58-4-6870

An Investigation of the Decomposition (cont.)

1.2% Mn. Variation in Mn content has its maximum effect in increasing the difference in strength values relative to rate of crystallization in alloys of the D16 type (with Mg), in which it attains 5-6 kg/mm^2, and to a lesser degree in alloys of the VD17 type (with Mg), and has practically no effect on alloys of the D20 type (without Mg). To assure maximum high-temperature corrosion resistance in the alloys it is necessary that ingots be crystallized at maximum speed. This is particularly important for alloys of the type of D16.

N. P.

1. Alloys--Crystallization 2. Alloys--Cooling methods 3. Aluminum --Applications 4. Copper--Applications 5. Magnesium--Applications 6. Manganese--Applications

Card 2/2

FRIDLYANDER, I.N.

137-58-1-1841

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 250 (USSR)

AUTHORS: Fridlyander, I.N., Khol'nova, V.I.

TITLE: A Method of Obtaining Special Electrical Properties in Aluminum Alloys by a Continuous Casting of Thin Sheet Blanks (Metod polucheniya osobykh elektricheskikh svoystv alyuminiyevykh splavov putem nepreryvnoy otlivki tonkoy listovoy zagotovki)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, 394-399

ABSTRACT: An installation has been developed for continuous production of 6-12 mm strip from an alloy of Al containing 3-3.5 Mn. The metal is extruded through a narrow aperture in the furnace onto a moving screen cooled by water from beneath. Quenching from the liquid state occurs, as a result of which a solid solution of Mn and Al, oversaturated from the liquid phase, is formed. The casting temperature varies within the 800-840° interval, and undesirable primary inclusions of intermetallic compounds appear when the temperature is lowered. Subsequent cold rolling to a thickness of 0.5 mm did not cause decomposition of the solid solution. The resultant sheet had a σ_b of 33-37 kg/mm^2 and

Card 1/2

137-58-1-1841

A Method of Obtaining Special Electrical Properties in Aluminum Alloys (cont.)

δ = 2-3 percent. Measurement of the electrical properties showed that in 0-200° interval, the temperature dependence of resistivity α is low and virtually invariable (~~ax~~ 0.9×10^{-3} ohm/1 C), and the resistivity is 0.110 ohm/mm^2/m. Heating to 300° and higher results in a reduction in resistivity and an increase in its temperature dependence.

P.N.

1. Aluminum alloys--Electrical properties--Processes

Card 2/2

137-1958-2-2684

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 2, p 69 (USSR)

AUTHORS: Fridlyander, I.N., Kondrat'yeva, N.B.

TITLE: The Structure and Properties of a Light-gage Sheet Bar of Alloy D 1 (an Aircraft Duralumin) (Issledovaniye struktury i svoystv tonkoy listovoy zagotovki iz splava D1)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 400-413

ABSTRACT: A study was made of the structure and properties of a cast billet and rolled sheets of the Al alloy D 1 (an aircraft Duralumin). It was found that when the Fridlyander-Golovkin method was used to cast a light-gage sheet bar, the strip was found to contain lower zones of equilibrium crystals and upper zones of fibrous crystals which attained a length of several meters. The appearance of the latter was caused by superheating the melt till the moment that crystallization began, followed by a rapid and rigidly controlled elimination of the heat. The elongation undergone by the fibrous crystals along the length of the fibers was extremely great, exceeding by 2-4 times the elongation undergone by the transverse specimens and by the specimens cut from the region of equiaxial

Card 1/2

137-1958-2-2684

The Structure and Properties of a Light-gage Sheet Bar of Alloy D 1

crystals. After thermal treatment the cast strip possessed great strength in all regions and all directions. Consequently, more propitious distribution and greater dispersion of the ingredients are required to obtain great elongations than are needed for great strength.

G.S.

1. Aluminum castings--Properties 2. Aluminum castings--Structural analysis

Card 2/2

137-58-6-12784

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 6, p 227 (USSR)

AUTHORS: Kondrat'yeva, N.B., Fridlyander, I.N.

TITLE: Investigation of the Possibility of Producing Finer Grain in Wire Made from Billets of the Cast Alloys D18, DZP, and V65 (Issledovaniye vozmozhnosti izmel'cheniya zeren v provoloke, poluchennoy iz litoy zagotovki splavov D18, DZP i V65)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 414-428

ABSTRACT: It is established, that the cause of many rejects by reason of cracks and lumpy surface of the locking heads of rivets is the coarse-grain structure in the finished wire. The possibility of producing rivet wire with fine-grain structure from cast alloy ingots D18, DZP, and V65 has been studied; the effect of the temperature of the melt in the furnace upon the structure of the cast ingot and the effect of the temperature of intermediate annealings upon the structure and properties of the finished wire were examined. It has been established that for the formation of uniform fine-grain structure in the finished wire it is necessary to combine the lowest possible temperatures of

Card 1/2

137-58-6-12784

Investigation of the Possibility (cont.)

casting the ingots with sufficiently high temperatures of intermediate annealings. A casting temperature of 705°C and annealing temperatures of 410-430° are termed optimal for the abovementioned alloys. The work performed establishes the possibility of producing high-quality riveting wire up to 5 mm diam from ingots of the cast alloys D18, DZP, and V65.

N.P.

1. Wire--Production 2. Wire--Mechanical properties 3. Metals--Casting
4. Grains (Metallurgy)--Metallurgical effects 5. Rivets--Effectiveness

Card 2/2

FRIDLYANDER, I. N.

137-58-3-6054

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 3, p 231 (USSR)

AUTHORS: Drits, M. Ye., Fridlyander, I. N.

TITLE: All-Union Conference on Light Alloys (Vsesoyuznaya konferentsiya po legkim splavam)

PERIODICAL: Tr. In-ta metallurgii. AN SSSR, 1957, Nr 2, pp 224-229

ABSTRACT: Called by the Institute of Metallurgy of the Acad. of Sciences & the MAP of the USSR, the 1955 all-union conference on light alloys summarized the results of the work of the industry and of the scientific research institutes with regard to the production, processing, and employment of light alloys in the national economy. The following topics were discussed at the conference: 1) the study of the requirements relative to light alloys and products made thereof as dictated by modern engineering processes; 2) exploration of novel alloys and perfection of heat treatment procedures; 3) the present state and prospects for the future development of blank and profiled casting; 4) present state and prospects for the future development of press working of light alloys. A brief survey of major reports presented at the conference is given.

Card 1/1

E. K.

FRIDLYANDER, I. N.

AUTHORS: Fridlyander, I.N., Edel'man, N.M., Danilov, Yu.S., 20-2-25/62

TITLE: An Investigation of the Static Endurance of the Allcys Al-Zn, Al-Mg, and Al-Cu. (Issledovaniye staticheskoy vynoslivosti splavov Al-Zn, Al-Mg, i Al-Cu.)

PERIODICAL: Doklady Akad.Nauk SSSR, 1957, Vol. 115, Nr 2, pp. 287-289 (USSR)

ABSTRACT: Static (slow) repeated stresses lead in a small number of cycles to the rupture as variable stresses which oscillate with great frequency. In the tests made by the authors the frequency of the stresses amounted to 6 to 8 cycles per minute. Three diagrams illustrate the variation of the mechanical characteristics and of the static endurance (number N) of the alloys Al-Zn, Al-Mg and Al-Cu. The testing was carried out in the following manner: In the first stage 2ooo stresses were taken at the upper tension of 0,7 σ_B^H(σ_B^H signifies here the solidity of the indented sample), then 1ooo cycles at σ_o = o,8 σ_B^H and finally the testing was continued at σ_o = o,9σ_B^H until the rupture. The number N corresponds to the number of cycles at σ_o = 0,9 σ_B^H. The lower stress amounted in all cases to o,o7 σ_B^H.

The number N very rapidly increases when the concentration of the admixture is increased and then again strongly decreases. Above a certain concentration a solid solution must more easily decompose than a less concentrated solution. Less concentrated solutions (Al + 2% Cu) solidity under the influence of elevated temperature. The more

Card 1/2

FRIDLYANDER, I.N., Doc Tech Sci--(diss) "~~Investigation of~~ Research in high-durability aluminum alloys of the system aluminum-lead-magnesium-copper." Mos, 1958. 14 pp (Min of Higher Education USSR. Mos Inst of Non-Ferrous Metals and Gold im M.I. Kalinin). List of author's works, pp 13-14 (24 titles) (KL,22-58,107)

SOV/137-58-10-21657

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 172 (USSR)

AUTHOR: Fridlyander, I.N.

TITLE: An Investigation of High-strength Deformable Aluminum Alloys of the Al-Zn-Mg-Cu System (Izyskaniye vysokoprochnykh deformiruyemykh alyuminiyevykh splavov sistemy Al-Zn-Mg-Cu)

PERIODICAL: V sb.: Legkiye splavy. Nr 1. Moscow, 1958, pp 49-85

ABSTRACT: A systematic investigation of binary, ternary, and quaternary alloys (A) of the Al-Zn-Mg-Cu system was carried out in order to determine the role of individual alloying elements in the process of hardening of A's. The effect of Mn, Cr, Fe, Si, and Ni on properties and kinetics of aging of A's of this system was also studied. Processes of aging in A's of the Al-Zn-Mg-Cu system were investigated, and hardening effects achieved by various heat-treatment procedures were determined. The strongest A's of this system contain 9-11% Zn, 3-4% Mg, and 0.5-1.5% Cu. σ_b values of up to 75-80 kg/mm^2 are achieved in extruded components made of A's containing Mn and Cr. The compositions of industrial A's were selected

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An Investigation of High-strength Deformable Aluminum Alloys (cont.)

on the basis of comprehensive tests on the mechanical properties, static endurance, corrosion resistance, and other characteristics of the A's. An experimental riveting A, V94, contains 6.0-6.7% Zn, 1.2-1.6% Mg, 1.8-2.4% Cu; Cr and Mn contents may not exceed 0.05 and 0.1%, respectively, and Fe and Si may not be present in concentrations greater than 0.15%. Natural aging of the A's V94 and V95 proceeds very slowly, thus, even after a period of three months these A's do not attain their maximum strength. Artificial aging of these A's may be accomplished in several stages. In the case of plated sheets of the V95 A, the regimen of aging consists of 24 hours of soaking at a temperature of 120°C, a 16-hour soak period at a temperature of 140° is employed in the case of non-plated components. The most expedient method, from the practical point of view, is the process of aging in stages consisting of a 3-hour soaking period at 120°, followed by three hours at 160°. The method of step-wise aging, involving 3 hours at 100° and 3 hours at 160°, is employed in the case of the riveting V94 A. Bibliography: 36 references.

1. Aluminum-copper-magnesium-zinc systems---Hardening

E.K.

Card 2/2

66519
SOV/137-59-7-15817

18.1210

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 7, p 230 (USSR)

AUTHOR: Fridlyander, I.N.

TITLE: Investigation Into the Effect of Solidification Rate on the Structure and Properties of Aluminum Alloys

PERIODICAL: V sb.: Zatverdevaniye metallov, Moscow, Mashgiz, 1958, pp 275 - 298

ABSTRACT: Investigations were carried out into the effect of crystallization rate and overheating on the properties and structure of Al-alloys in continuous ingot casting. It was proved that high chilling rates in crystallization (70 degrees per second) increased mechanical properties of Al-alloys in cast condition. A technological process is suggested permitting to obtain a sheet semi-product without passing through the ingot stage. The crystallization process was observed on a transparent organic camphene substance with the use of cinematographic means. The effect of the rate of crystal growth on the mechanical properties and on the dimensions and distribution of impurities is shown. The strength of cast Al-alloys increases and attains in heat-treated condition the strength of deformed Al-alloys; δ , however, remains low. Maximum increase of mechanical

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SOV/137-59-7-15817

Investigation Into the Effect of Solidification Rate on the Structure and Properties of Aluminum Alloys

properties is obtained by casting a thin liquid metal layer onto a moving water-washed screen. A great dropping of true temperatures in the crystallization area causes the origination of a metastable oversaturated solid solution, yielding new properties. Exceptionally low temperature factors of electrical resistance for Al-Mn alloy can be obtained by continuous casting of thin Al alloy sheets. 24 bibliographic titles.

G.E.

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Card 2/2

SOV/137-59-3-6901

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 3, p 283 (USSR)

AUTHOR: Fridlyander, I. N.

TITLE: An Investigation of Oxide-film Inclusions in Stampings of Aluminum Alloys (Issledovaniye vklyucheniy tipa okisnykh plen v shtampovkakh iz alyuminiyevykh splavov)

PERIODICAL: V sb.: Gidrodinamika rasplavl. metallov. Moscow, AN SSSR, 1958, pp 209-236

ABSTRACT: The following was established as a result of the investigation: 1) The occurrence of oxide films (OF) in Al-alloy ingots is primarily attributable to the entrapment of OF's from the surface of the stream of the liquid metal as it is poured from the furnace into the ladle, from the ladle into the mixer, and, particularly, from the mixer into the crystallizing basin of the continuous casting machine; 2) the number and over-all area of the OF's found in fractures which are parallel to the plane in which the dies converge increase extremely rapidly as the degree of deformation of metal is increased; 3) in the process of plastic deformation, the OF's are straightened and then ruptured, and the volume of metal which they affect is appreciably increased;

Card 1/2

An Investigation of Oxide-film Inclusions in Stampings of Aluminum Alloys

under conditions of severe deformation, nonuniform flow of metal throughout the cross section of the article, and considerable normal pressure on the flowing layers of the metal, considerable friction occurs between the metal and the solid, brittle particles of the OF's; this leads to a pronounced local hardening and heating of the metal, and results in the appearance of local laminations and discontinuities; 4) the purity of metal is greatly enhanced if during pouring (from the furnace into the ladle, from the ladle into the mixer, and from the mixer into the crystallizing basin of the continuous casting machine) the liquid metal is completely enclosed in runner and fountain tubes; 5) after the selection of appropriate ceramic materials, the same system of enclosed [ducted] pouring of metal may be expediently employed in casting of ingots and shaped articles made not only of Al alloys but of Mg, Cu, and other alloys as well.

Ye L.

Card 2/2

SOV/137-58-11-22257

Translation from: Referativnyy zhurnal. Metallurgiya, 1958, Nr 11, p 59 (USSR)

AUTHOR: Fridlyander, I. N.

TITLE: Special Features of Continuous Casting of Ingots of V95 Alloy (Osobennosti nepreryvnogo lit'ya slitkov iz splava V95)

PERIODICAL: V sb.: Legkiye splavy. Nr 1. Moscow, 1958, pp 311-327

ABSTRACT: When 370-mm ingots (I) of V95 alloy are continuously cast with air cooling, smaller liquation ("bleeding") beads appear on the surface than when water cooling is used. The high rate of liquation bleeding with water cooling is due to the more significant rise in temperature during the secondary heating of the peripheral layers of the I. Heating under these conditions results in fusion of the low-melting eutectics and their expulsion to the surface due to increase in the volume of the alloy as it enters the molten state. The mechanical properties of the Me in I cast with water cooling are virtually identical across the entire section. The peripheral layers of an air-cooled I have mechanical properties similar to those of I cast with water cooling, but as one moves toward the center of the I the ultimate strength and ductility diminish both in the cast and in the

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Special Features of Continuous Casting of Ingots of V95 Alloy

heat-treated condition. Water cooling also results in higher mechanical properties of rolled Me. At the center of an I of V95 alloy, one frequently finds structural inhomogeneity in the form of bright crystallites containing 0.07-0.14% less Cu, 0.12% less Mg, and 0.09-0.41% less Zn. Intermetallic inclusions are also observed in the central zone and the head portion. The composition of these inclusions apparently corresponds to the formulas Al_7Cr and Al_6Mn. When bright crystallites and intermetallic compounds are present, the mechanical properties of the alloy are impaired. The appearance thereof is due to the chilled residue forming beneath the bottom of the tundish, which distributes it into the molten portion of the metal in the mold. For elimination of these defects it is recommended that formation of chilled residue be prevented (by increasing the heating of the tundish and increasing the distance between its bottom and that of the funnel of molten metal), that the Cr contents of the alloy be limited (to the 0.10-0.17% range), and that Mn be held to 0.25-0.32%).

G. N.

Card 2/2

DRITS, M.Ye.; FRIDLYANDER, I.N.; SOFIANO, N.K., red.; SIVKOVA, N.N., tekhn.red.

[Aluminum-base alloys; their applications and prospects of use in the economy] Splavy na osnove aliuminiia; primenenie i perspektivy ispol'zovaniia ikh v narodnom khoziaistve. Moskva, Vses.in-t nauchn.i tekhn.informatsii, 1959. 57 p. (MIRA 13:6)
(Aluminum alloys)

FRIDLYANDER, Iosif Naumovich, doktor tekhn.nauk; DOBATKIN, V.I., doktor tekhn.nauk, retsenzent; ZILOVA, T.K., kand.tekhn.nauk, red.; SUVOROVA, I.A., izdat.red.; ORESHKINA, V.I., tekhn.red.

[High-strength deformable aluminum alloys] Vysokoprochnye deformiruemye aliuminievye splavy. Moskva, Gos.nauchno-tekhn.izd-vo, 1960. 290 p. (MIRA 13:5)
(Aluminum alloys)

82622
S/180/60/000/004/017/027
E193/E483

18.1210

AUTHORS: Archakova, Z.N., Romanova, O.A. and Fridlyander, I.N. (Moscow)

TITLE: Investigation of the Properties of Alloys of the Al-Cu-Li-Cd-Mn System at Room and Elevated Temperatures

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, No.4, pp.106-110

TEXT: The alloys studied in the course of the investigation described in the present paper contained 0 to 3% Li and 4.0 to 6.5% Cu, the content of other alloying additions being constant and amounting to 0.1% Cd, 0.6% Mn and no more than 0.3% each of Fe and Si. The mechanical properties of the alloys were determined after 4 types of thermal treatment: (1) solution treatment, i.e. quenching from 525 to 535°C; (2) annealing, i.e. cooling from 430 to 150°C in 7 days; (3) ageing at room temperature for 7 days; (4) ageing at temperatures between 150 and 200°C for 12 h at 200°C and 16 h at other temperatures. The mechanical tests were carried out both at room and elevated (200 to 250°C) temperatures on specimens machined from extruded rod and appropriately heat-treated. It was found that

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Investigation of the Properties of Alloys of the Al-Cu-Li-Cd-Mn System at Room and Elevated Temperatures

simultaneous introduction of 0.9 to 1.4% Li and 0.1% Cd greatly increased the strength of the Al-Cu-Mn alloys in the age-hardened condition and, on the basis of the results obtained, the composition of a new, high strength rod alloy, suitable for high temperature service, was determined. The nominal composition of the new alloy VAD23 is: 5.4% Cu, 1.25% Li, 0.6% Mn, 0.15% Cd, remainder Al; its U.T.S. and 0.2% proof stress at 20°C are 60 and 54 kg/mm^2 respectively. Regarding its room-temperature strength, the new alloy resembles the high strength, Al-Zn-Mg-Cu alloys (type V95); its mechanical properties at high temperatures (150 to 250°C) are better than those of any known Al-base alloy of this type and, what is particularly important, the alloy retains its strength after long periods at these temperatures. Thus, the U.T.S. and elongation δ of the VAD23 alloy, held at 200°C for 0.5 h, were 46.9 kg/mm^2 and 6.3% respectively, the corresponding figures for the V95 alloy being 40 kg/mm^2 and 12.6%. After 100 h at the temperature, U.T.S. and δ of the VAD23 alloy were still

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Investigation of the Properties of Alloys of the Al-Cu-Li-Cd-Mn System at Room and Elevated Temperatures

42.4 kg/mm^2 and 6.3%, whereas U.T.S. of the V95 alloy fell to 19.3 kg/mm^2, its δ increasing to 19.8%. The corrosion resistance of the new alloy is not impaired by its lidium content; its specific gravity (2.73 g/cm^3) is slightly lower and its molecules of elasticity slightly higher than those of the standard aluminium alloys D16 and V95. There are 5 figures, 2 tables and 10 references: 2 Soviet, 5 English and 3 German.

SUBMITTED: March 17, 1960

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S/689/61/000/000/002/00
D205/D303

18.1210 (240P)

AUTHORS: Fridlyander, I.N., and Zakharov, Ye.D.

TITLE: Strengthening of aluminum by Mg_2Ge

SOURCE: Fridlyander, I.N., V.I. Dobatkin, and Ye.D. Zakharov, eds. Deformiruyemyye alyuminyevyye splavy; sbornik statey. Moscow, 1961, 9 - 16

TEXT: It was assumed that Mg_2Ge has a limited solubility in Al and its strengthening action is analogous to that of Mg_2Si, Mg_2Zn_2 etc. The present work gives the result of microscopic, X-ray, microhardness and DTA investigations of the Al-Mg_2Ge alloys and their mechanical properties as a function of thermal treatment regimes. 99.93 % Al, 99.91 % Mg and 99.993 % pure Ge were employed for the preparation of alloys containing 0.22, 0.45, 0.6, 0.9, 1.35, 1.9, 2.7, 3.5 and 4.3 % Mg_2Ge (w/w). 1 Kg ingots were homogenized at 550°C for 12 hours and pressed at 450°C into 10 mm diameter rods. The samples were quenched

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S/689/61/000/000/002/030
D205/D305

Strengthening of aluminum by Mg_2Ge

from 600, 500 and 350°C after annealing for 2, 4 and 8 days respectively. Crystal lattice parameters and microhardness measurements were performed. On the basis of the measurements the Al corner of an Al-Mg_2Ge diagram was constructed. The maximum solubility of Mg_2Ge is about 1.2 %, at 600°C about 1 %, at 500°C - 0.5 %, at 350°C - 0.3 %. Tensile strength, relative elongation and wasting were measured on annealed (360°C - 2 hours), quenched (from 600°C), naturally (7, 14 and 28 days) and artificially aged (at 160°C during 4, 8, 12 and 16 hours and at 180°C during 2, 4, 8 and 12 hours) alloys. The results are plotted. It is shown that the Al-Mg_2Ge alloys are strengthened by quenching with subsequent natural or accelerated ageing. Quenching increases the tensile strength only slightly. On natural ageing, strengthening takes place mainly during the first 7 days; during the accelerated ageing strengthening occurs in the first 4 hours at 160°C and the first 2 hours at 180°C. The maximum tensile strengths of 25 - 25 and 30 - 32 kg/mm^2 for the naturally and artificially aged alloys respectively were shown by alloys containing 2.7 % Mg_2Ge, i.e. outside the α-solid solution zone. Parallel to the increase of tensile strength

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Strengthenging of aluminum by Mg_2Ge

S/689/61/000/000/002/03[illegible]
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the relative elongation and wasting decrease. This work confirms the analogy between the Al-Mg_2Ge and Al-Mg_2Si or Al-$MgZn_2$ alloys. The data on the limited solubility of Mg_2Ge in Al are consistent with the solubility series of the compounds Mg_2Si, Mg_2Ge, Mg_2Sn and Mg_2Pb in which the solubility decreases practically to zero passing from Mg_2Si to Mg_2Pb. There are 5 figures and 10 references: 5 Soviet-bloc and 5 non-Soviet-bloc. The reference to the English-language publication reads as follows: L.F. Mondolfo, Metallography of Aluminum Alloys, New York, 1943.

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S/0[illegible]/61/000/000/00[illegible]/[illegible]
D205/D303

Simultaneous solubility of copper ...

change from the α-solid solution to the heterogeneous region was
determined. Below this point, the hardness increases gradually with
Cu %; above this point a very slight straight line increase in the
hardness takes place. From these data the Al corner of the Al-Li-Cu
phase diagram at 500°C has been constructed. A small amount of Li in-
creases the solubility of Cu in Al which remains constant (4. 25%)
at Li contents from 0.75 to 1.5 %. Further increases in Li concentra-
tion sharply decrease the solubility of Cu. The maximum mutual solu-
bility corresponds to 4.5 % Cu and 1.5 % Li. The microstructure exa-
mination of alloys quenched from 200°C revealed finely dispersed in-
termetallic phases, even at the lowest Cu and Li concentrations. This
leads to the conclusion that at 200°C the solubility of Cu and Li in
Al does not exceed 0.2 %. It was not possible to determine microsco-
pically the limits between the phases T_1 and T_2 (Al_2CuLi and Al_6CuLi_3)
In low hertogenic alloys the phase T_3 was not revealed ($Al_{7.5}CuLi$).
The solubility data show that the alloys of the Al-Cu-Li system can
be considerably improved by heat-treatment. The maximum of the simul-
taneous solubility of Cu and Li in Al corresponds to the equilibrium

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Simultaneous solubility of copper ... S/[illegible]/61/000/000/004/0[illegible]
D205/D303

of the solid solutions with the T$_2$ phase. It was noted that all alloys with up to 7 % Cu and 3 % Li have resisted a considerable deformation and therefore they ought to possess high hardening and [illegible] effects, high heat-resistance and be amenable to pressure working. There are 5 figures and 4 non-Soviet-bloc references. The references to the English-language publications read as follows: I.N. Silkok, Journ. Inst. Met., April 1960, p. 557; M. Hasner, Constitution of binary alloys, New York-Toronto-London, 1958, p. 84; H.K. Hardy, and I.M. Silkok, Journ. Inst. Met., July 1956, p. 423.

Card 3/3

S/689/61/000/000/003/030
D205/D303

AUTHORS: Galatskiy, B.D., Tulyankin, F.V., and Fridlyander, I.N.

TITLE: Determining heating time before hardening to attain maximum strength as a function of the quenching temperature and drawing coefficient of pressed articles of AK 1 (D1) alloys

SOURCE: Fridlyander, I.N., V.I. Dobrykin, and Ye.D. Zakharov, eds. Deformiruyemyye alyuminiyevyye splavy; sbornik statey, Moscow, 1961, 59 - 65

TEXT: A definite regularity was observed in the change of the maxima of strength curves with the change of the duration of heating before quenching. The investigations were performed on articles of D1 alloy pressed at 380 - 400°C with drawing coefficients from 2.8 to 170. The heating time before hardening varied from 1 minute to 15 hours. The regularity in the location of maxima on the strength curves is caused by two processes: 1) Strengthening, induced by saturation of the solid solution by Al, Mg and Cu; 2) Weakening caused by

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Determining heating time before ...

separation of Mn from the solid solution. It is observed that the heating time needed to obtain the maximum strength (τ_{max}) increases with the decrease of the quenching temperature (t_z) and of drawing coefficient (λ). The correlation is graphically depicted by

$$\tau_{max} = 2^{\frac{510-t_z}{10}} \frac{10^4}{\lambda^2} \qquad (1)$$

where f is the ratio of perimeters profile/rod of equal cross-section. On the basis of the formula a nomogram linking the equation parameters was constructed. There are 3 figures.

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S/689/61/000/000/012/0[illegible]
D205/D305

AUTHORS: Galatskiy, B.D., Tulyankin, F.V., and Fridlyander, I.N.

TITLE: Methods of improving the mechanical properties of pressed profiles and rods of the [illegible] 16 (D16) alloy

SOURCE: Fridlyander, I.N., V.I. Dobatkin, and Ye.D. Sakharov, eds. Deformiruyemyye alyuminiyevyye splavy; sbornik statey, Moscow, 1961, 95 - 105

TEXT: The main cause of weakening is the formation of a coarse-grained structure. Examination of 450 batches of pressed profiles having a wall thickness of 5 mm has shown that 22.4 % of the batches had worse mechanical properties than those specified. The following measures are recommended for improving the quality of the industrial products: Use of precise chemical composition for D16 (3.8 - 4 % Cu, 1.4 - 1.6 % Mg, 0.7 - 0.9 % Mn; Fe and Si impurities not more than 0.5 % each, Zn not more than 0.2 %) ensures a uniformity in the mechanical properties and prevents the formation of a coarse-grained

Card 1/2

Methods of improving the mechanical ...

structure. The pressing of the small and medium profiles has to be done at the ingot temperature of 370 - 380°C and for the larger profiles at 410 - 420°C. This ensures a better quality of the profile surface and increases the productivity of the process. There are 3 figures and 3 tables and 5 Soviet-bloc references.

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35023
S/639/61/000/000/014/030
D205/D303

18.1210 (2408)

AUTHORS: Fridlyander, I.N., and Zaknarov, Ye.D.

TITLE: Influence of manganese on the ageing of certain aluminum alloys

SOURCE: Fridlyander, I.N., V.I. Dobatkin, and Ye.D. Zaknarov, eds. Deformiruyemyye alyuminiyevyye splavy; sbornik statey. Moscow, 1961, 113 - 115

TEXT: This paper is concerned with the influence of Mn on the kinetics of ageing of alloys in the Al-Cu-Mg system. Composition ranging from 5.7 to 5.65 % Cu, 1.57 - 2.96 % Mg and 0.8 - 1.21 % Mn were smelted and homogenized at 480°C for 24 hours. The thermal treatment consisted of quenching from 495°C after 1 hour's heating at this temperature and ageing at 200°C over 2, 4, 8 and 12 hours. Non-aged and aged specimens were tested. Analysis of the data shows that Mn increased the strength in the quenched state, which is probably connected with the press-effect. Ageing-strengthening is more rapid in alloys with Mn and higher strength limits and yield points are achie-

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35024

S/659/61/000/000/015/030
D205/D303

18.1210 (2408)

AUTHORS: Fridlyander, I.N., Zakharov, Ye.D., and Fulakov, V.I.

TITLE: Application of cold-working to increase the strength of D4-1 (AK4-1) alloy drop-forged articles

SOURCE: Fridlyander, I.N., V.I. Dobatkin, and Ye.D. Zakharov, eds. Deformiruyemyye alyuminiyevyye splavy; sbornik statey. Moscow, 1961, 116 - 125

TEXT: This is an investigation of the influence of cold working, which is the only means of improving the strength characteristics of Al alloys besides heat treatment, on the kinetics of ageing of the AK4-1 alloy. The prepared ingots had the following composition: 2.1 % Cu, 1.83 % Mg, 1.21 % Ni, 1.36 % Fe, 0.082 % Ti, the rest Al of the AB000 (AV000) grade. The ingots were homogenized at 520°C over 24 hours and pressed to strips of 10 x 40 mm cross-section. They were rolled at 350 - 400°C to 6 mm thickness. One part of the strips was hardened and naturally aged during 30 days, whilst the remainder were hardened and cold-worked by rolling with 10 and 20 % deforma-

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PHASE I BOOK EXPLOITATION SOV/5685

Fridlyander, I. N., Doctor of Technical Sciences, and B. I. Matveyev, Candidate of Technical Sciences, eds.

Teploprochnyy material iz spechennoy alyuminiyevoy pudry [SAP]; sbornik statey (Heat-Resistant Material From Baked Aluminum Powder [SAP]; Collection of Articles) Moscow, Oborongiz, 1961. 122 p. Errata slip inserted. 3,550 copies printed.

Reviewers: M. F. Bazhenov, Engineer, and M. Yu. Bal'shin, Candidate of Technical Sciences; Ed.: M. A. Bochvar, Engineer; Ed. of Publishing House: S. I. Vinogradskaya; Tech. Ed.: V. I. Oreshkina; Managing Ed.: A. S. Zaymovskaya, Engineer.

PURPOSE : This collection of articles is intended for scientific workers and engineers in the institute and plant laboratories of the metallurgical and machine-building industry; it may also be useful to instructors and advanced students.

COVERAGE: The 12 articles contain the results of research on the structure, properties, and manufacture of semifinished products

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from sintered aluminum powder. The technology for the manufacture of aluminum powder and briquets is described as are sintering processes, and pressing, rolling, drawing, and sheet-stamping methods. The dependence of the properties of semifinished products on the aluminum-oxide content of the powder, on the degree of hot and cold deformation, and on the stresses of pressing is investigated. Also investigated are the mechanical and corrosive properties of semifinished products, the mechanism of hardening of sintered aluminum powder, the reasons for blister formation, and the possibility of recrystallization. Data on sintered aluminum alloys are included. No personalities are mentioned. References in the form of footnotes accompany the articles.

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Heat-Resistant Material From (Cont.) SOV/5685

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FRIDLYANDER, I.N., doktor tekhn. nauk, red.; AL'TMAN, M.B., kand. tekhn. nauk, red.; BAZHENOV, M.F., inzh., retsenzent; RZHEZNIKOV, V.S., kand. tekhn. nauk, red.; ANIKINA,M.S., red.izd-va; ORESHKINA, V.I., tekhn. red.

[Aluminum foundry alloys (properties, technology of melting, casting and heat treatment)] Liteinye aliuminevye splavy (svoistva, tekhnologiia plavki, lit'ia i termicheskoi obrabotki); sbornik statei. Moskva, Gos. nauchno-tekhn. izd-vo Oborongiz, 1961. 202 p. (MIRA 15:2)
(Aluminum alloys) (Founding)

FRIDLYANDER, I.N., doktor tekhn. nauk, red.; DOBATKIN, V.I., doktor tekhn. nauk, red.; ZAKHAROV, Ye.D., kand. tekhn. nauk, red.; BAZHENOV, M.F., inzh., retsenzent; MAKOVSKIY, G.M., inzh., red.; VINOGRADSKAYA, S.I., red. izd-va; GARNUKHINA, L.A., tekhn. red.

[Malleable aluminum alloys] Deformiruemye aliuminievye splavy; sbornik statei. Moskva, Gos. nauchno-tekhn. izd-vo Oborongiz, 1961. 234 p. (MIRA 15:1)

(Aluminum alloys)

S/137/62/000/005/100/150
A006/A101

AUTHORS: Fridlyander, I. N., Zakharov, A. M.

TITLE: Strengthening aluminum by the chemical compound Mg_2Ge

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1962, 70 - 71, abstract 5I428 (V sb. "Deformiruyemyye alyum. splavy", Moscow, Oborongiz, 1961, 9 - 16)

TEXT: The authors studied the Mg_2Ge compound in solid Al and the mechanical properties of Al-Mg_2Ge alloys depending on the heat-treatment conditions. Alloys containing 0.22, 0.45, 0.6, 0.9, 1.35, 1.9, 2.7, 3.5 and 4.3 weight % of Mg_2Ge, were manufactured by alloying at 720 - 740°C Al of 99.93% purity, Mg of 99.91% and Ge of 99.993% purity. Ingots weighing 1 kg were homogenized at 550°C during 12 hours and then at 430°C pressed into 10-mm-diameter rods. Determination of the crystal lattice parameters, microhardness of α-solid solution and a microscopical analysis of the alloys were carried out on specimens quench-hardened from 600, 500 and 350°C after annealing for 2, 4 and 8 days respectively. Maximum solubility of Mg_2Ge in solid Al is about 1.2%; at 600°C it is 1.0%; 0.5% at

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S/137/62/000/005/100/150
A006/A101

Strengthening aluminum by the chemical compound Mg_2Ge

500°C and 0.3% at 350°C. Maximum σ_b in naturally or artificially aged state (σ_b is 23 - 25 and 30 - 32 kg/mm^2), is shown by alloys containing about 2.7% Mg_2Ge, i.e. being beyond the single-phase zone of the α-solid solution. Strengthening of quenched alloys increases gradually with a higher Mg_2Ge content, without attaining a maximum even at 4.3%. Maximum strengthening in aging is obtained in alloys with 1.9 - 2.7% Mg_2Ge. The investigation has confirmed regularities established previously for Al-Mg_2Si alloys.

T. Rumyantseva

[Abstracter's note: Complete translation]

Card 2/2

37262

S/137/62/000/005/112/150
A006/A101

AUTHORS: Fridlyander, I. N., Zakharov, A. M.

TITLE: Phase diagram and mechanical properties of Al-AlAgMg alloys

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1962, 74, abstract 5I447 (V sb. "Deformiruyemyye alyumin. splavy", Moscow, Oborongiz, 1961, 17 - 23)

TEXT: The authors studied solubility of the AlAgMg compound in Al and also the mechanical properties of Al-AlAgMg alloys depending on heat treatment conditions. Alloys containing about 2.4; 3.6; 4.8; 6.0; 8.4; 10.8; 13.2 and 16.8 weight % AlAgMg, were prepared by melting at 720 - 740°C from Al of 99.93% purity; Mg of 99.91% and Ag of 99.98% purity. Parallel with an increase in σ_b, and ψ of the alloys decrease, to a lower degree in natural and to a higher degree in artificial aging. Maximum σ_b in naturally and artificially aged state (σ_b 34 - 35 and 37 - 40 kg/mm^2 respectively) is shown by alloys containing about 13.2% AlAgMg. Maximum quenching effects are shown by alloys of the heterogeneous range, and maximum effects of natural and artificial aging are shown by

Card 1/2

Phase diagram and...

alloys in the solid solution range. In alloys containing 2.4 - 10.8% of the AlAgMg compound, the effect of natural aging exceeds the quenching effect, while in more alloyed alloys it is, on the contrary, below the quenching effect. The maximum effect of artificial aging is shown by alloys in the solid solution range which contain 10.8 - 13.2% of the AlAgMg compound.

T. Rumyantseva

[Abstracter's note: Complete translation]

Card 2/2

S/137/62/000/006/098/163
A160/A101

AUTHORS: Fridlyander, I. N., Shamray, V. F.

TITLE: The joint solubility of copper and lithium in alumirum at 500 and 200°C

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 17, abstract 6I103 (In collection: "Deformiruyemyye alyumin. splavy", Moscow, Oborongiz, 1961, 24 - 29)

TEXT: The joint solubility of copper and lithium in aluminum alloys containing a maximum of 7% Cu and 3% Li was investigated by the methods of microscopical analysis and hardness measuring. The alloys were produced by melting A000-grade aluminum, Л3 -1 (LE-1)-grade lithium and electrolytic copper under a layer of LiCl + KCl flux of eutectic composition. The alloys were annealed at 500°C for 150 hours and at 200°C for 450 hours, and quenched in water. The maximum joint solubility of copper and lithium in aluminum is observed at 500°C, when the summary content of copper and lithium is 6% (4.5% of Cu + 1.5% of Li). With decreasing temperature, the solubility also decreases and does not exceed 0.2%

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S/137/62/000/006/098/163
A160/A101

Tne joint solubility of,,,

(0,1% of Cu + 0,1% of Li) at 200°C. According to the data of investigations carried out on Al-Cu-Li alloys which contain up to 7% Cu and up to 3% Li, it may be assumed that the alloys possess a high hardening and aging effect, are heat-resistant and can well be machined by pressure.

Z. Rogachevskaya

[Abstracter's note: Complete translation]

Card 2/2

S/137/62/000/005/123/150
A160/A101

AUTHORS: Galatskiy, B. D., Tulyankin, F. V., Fridlyander, I. N.

TITLE: The determination of the duration of quenching heating for attaining the maximum tensile-strength values in relation to the temperature of quenching and the coefficient of drawing of pressed products from Д 1 (D1) alloy

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 5, 1962, 129, abstract 5I787 (V sb. "Deformiruyemyye alyumin. splavy". Moscow, Oborongiz, 1961, 59 - 63).

TEXT: The investigation was carried out with products made from D1 Al-alloy and pressed out at 380 - 400°C with a coefficient of drawing from 2.8 to 170. The pieces were quench-heated in a potassium nitrate bath of up to 460 - 510°C for a period ranging from 1 minute to 15 hours. Presented is a formula determining the duration of quenching heating τ_{max} necessary for obtaining the maximum values of σ_b:

$$\tau_{max} = 2^{\frac{510-t_3}{10}} (10^4/f.\lambda^2),$$

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The determination of...

where t_3 = the temperature of quenching, λ = the drawing coefficient, $f = P_{prof}/P_f$ (P_{prof} = the perimeter of the profile, P_f = the circumferential length of the rod under equality conditions of the sections $F_{prof} = F_f$; for the rods $f = 1$, and for the profiles $f > 1$). It has been established that the regularity of change of $\sigma_{0.2}$ in relation to λ, the temperature and τ_{max} is completely analogous to the regularity of change of σ_b.

A. Babayeva

[Abstracter's note: Complete translation]

Card 2/2

S/123/62/000/013/003/021
A004/A101

AUTHORS: Galatskiy, B. D., Tulyankin, F. V., Fridlyander, I. N.

TITLE: Ways of improving the mechanical properties of pressed shapes and bars from the Д 16 (D16) alloy

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 13, 1962, 22, abstract 13A141 (In collection: "Deformiruyemyye alyumin. splavy". Moscow, Oborongiz, 1961, 95 - 103)

TEXT: It is pointed out that, to obtain a high level and stability of mechanical properties and to prevent the formation of a macro-crystalline structure in shapes and bars of the D16 alloy, a more accurate chemical composition of the D16 alloy is necessary (3.8 - 4% Cu, 1.4 - 1.6% Mg, 0.7 - 0.9% Mn, 0.2% Zn, Si + Fe up to 0.5%). Small and medium-size shapes should be pressed at a temperature of 370 - 380°C, large shapes at 410 - 420°C.

[Abstracter's note: Complete translation]

Card 1/1

S/137/62/000/006/122/163
A052/A101

AUTHORS: Galatskiy, B. D., Tulyankin, F. V., Fridlyander, I. N.

TITLE: Methods of raising mechanical properties of Д16 (D16) alloy pressed shapes and rods

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1962, 58, abstract 61347 (V sb. "Deformiruyemyye alyumin. splavy". Moscow, Oborongiz, 1961, 95 - 103)

TEXT: The introduction into production of D16 alloy of an improved chemical composition (3.8 - 4% Cu, 1.4 - 1.6% Mg, 0.7 - 0.9% Mn, up to 0.5% Fe and Si each, up to 0.2% Zn) raises the level and stability of mechanical properties and prevents formation of a coarse-crystalline structure in shapes and rods. Small and medium shapes should be pressed at the ingot temperature of 370 - 380°C and larger shapes at the ingot temperature of 410 - 420°C, which results in a higher efficiency of presses and a better finish of shapes. A high Mn content in D16 alloy (0.8 - 0.9%) does not cause a decrease of δ in the lateral direction.

T. Rumyantseva

[Abstracter's note: Complete translation]

Card 1/1

ESKIN, G.I. (Moskva); FRIDLYANDER, I.N. (Moskva)

Effect of ultrasonic waves on the shape and size of metal compound crystals in aluminum alloys. Izv.AN SSSR.Otd.tekh.nauk.Met.i topl. no.5:109-112 S-O '61. (MIRA 14:10)
(Aluminum alloys—Metallography)
(Intermetallic compounds)
(Ultrasonic waves—Industrial applications)

39511

18.1210

S/123/62/000/014/012/020
A004/A101

AUTHORS: Fridlyander, I. N., Zakharov, Ye. D.

TITLE: The effect of manganese on the ageing of certain aluminum alloys

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 14, 1962, 32, abstract 14B186 (In collection: "Deformiruyemyye alyumin. splavy". Moscow, Oborongiz, 1961, 113 - 115)

TEXT: The authors present the comparative mechanical properties of alloys of the Al-Cu-Mg and Al-Su-Mg-Si systems with and without 0.80 - 1.21% Mn-additions after hardening and ageing of the extruded parts. Test specimens were quenched in water at 495°C and aged at 200°C for 2, 4, 8, and 12 hours. The mechanical tests were carried out immediately after hardening and after hardening and subsequent ageing. It was found that Mn-additions to the alloys mentioned ensure a faster increase of their characteristic strength values - σ_b and σ_s, during ageing on account of an accelerated decomposition of the solid solution, caused by a distortion of the crystalline lattice by the manganese. The effect of the manganese on the decomposition kinetics is analogous to that of cold plastic defor-

Card 1/2

The effect of manganese on...

mation on the freshly hardened solid solution. There is 1 figure.

V. Stasevich

[Abstracter's note: Complete translation]

X

Card 2/2

S/123/62/000/013/007/021
A004/A101

AUTHORS: Fridlyander, I. N., Zakharov, Ye. D., Kulakov, V. I.

TITLE: Using cold working to increase the strength of the AK4 -1 (AKCh-1) alloy

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 13, 1962, 28, abstract 13B171 (In collection: "Deformiruyemyye alyumin. splavy". Oboron-giz, 1961, 116 - 123)

TEXT: The authors investigated the effect of cold deformation on the aging kinetics of the AKCh-1 aluminum alloy, having a composition of (in %): 2.11 Cu, 1.83 Mg, 1.21 Ni, 1.36 Fe, 0.082 Ti, the rest being Al, using specimens which, after the casting, were subjected to diffusion annealing at 520°C for 24 hours. Then the ingots were pressed, rolled at 350 - 400°C into strips of 6 mm thickness and were then subjected to hardening with subsequent natural ageing in the course of 30 days or rolling immediately after hardening with a degree of deformation of 10 and 20%. After cold working, the specimens were subjected to artificial ageing at 20, 170, 180, 190, 200 and 210°C. It was found that cold working con-

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S/078/61/006/005/010/015
B121/B208

AUTHORS: Zakharov, A. M., Fridlyander, I. N., and Edel'man, N. M.

TITLE: Study of the phase diagram of the quaternary system Al-Zn-Mg-Cu in the range of high aluminum content

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 5, 1961, 1165 - 1171

TEXT: In order to clarify some contradictory data on the phase composition of the alloys of the system Al-Zn-Mg-Cu in the papers by G. V. Kelevich-Kizilevich (Ref. 24: Kandidatskaya dissertatsiya, MATI, 1947) and by D. G. Straubridge, W. Hume-Rothery, and A. T. Little (Ref. 28: J. Inst. Met., 74, 191, 1947) the authors studied various alloys of this system at temperatures of 430 and 200°C. The alloys with compositions of 4, 6, and 8% zinc, of 0,5-5% and 0,5-7% Cu and Mg, the rest Al, were prepared in the electric furnace. 99,95% Al, 99,945% magnesium, and 99,95% Zn were used as initial materials. The alloys were microscopically examined after hardening and annealing at the corresponding temperatures.

Card 1/3

Study of the phase diagram of ...

To attain the equilibrium state, the alloys were subject to heat treatment in the following way: The samples were slowly heated to 460°C in evacuated quartz ampuls, and left for 7 hr at this temperature. A part of the samples was then hardened, and the rest was cooled to 430°C. After 10 hr the samples were hardened by a stepwise thermal process for 15 hr at 315°C, and for 18 hr at 300°C, then cooled to 200°C within 48 hr, and hardened again with cold water. The following etching agents were used to develop the various phases for studying the alloys: 10% NaOH, Keller reagent (0,5 % HF + 1,5 % HCl + 2,5 % HNOS + 95,5 % H_2O) 20-30 sec, 0.5 % HF 15-30 sec, 2% HNO_3 solution 15-20 sec, concentrated HNO_3 5-7 sec, and vapors of concentrated HNO_3 7-10 sec. The phases Q ($CuAl_2$), S(Al_2CuMg), and T (solution of Al_6CuMg_4 and $Al_2Zn_3Mg_3$) were found to be present in equilibrium in alloys with a 5% Zn content at temperatures of 460, 430, and 200°C. The appearance of a phase Z in the alloys with 8% zinc is possible not only at 460°, but also at lower temperatures such as 430 and 200°C. To determine the phases of the alloys with 6 and 8% zinc, the grindings were etched with vapors of concentrated nitric acid. The

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S/078/61/006/005/010/015
B121/B208

Study of the phase diagram of ...

stabilizing phases for the economic high-strength alloys were determined from the results obtained. The phases M, S, and T appear as the stabilizing phases for the alloys Б 95 (V 95) (5-7.0 % Zn, 1.4-2.0 % Cu, 1.8-2.8 % Mg, 0.2-0.6 % Mn, 0.1-0.25 % Cr, rest Al), Б 96 (V 96) (7.6-8.6 Zn, 2.2-2.8 % Cu, 2.5-3.2 % Mg, 0.2-0.5 % Mn, 0.1-0.25 % Cr, rest Al), and the phases M and S for the alloy Б 94 (V 94) (6.0-6.7 % Zn, 1.8-2.4 % Cu, 1.2-1.6 % Mg, 0.02-0.08 % Ti, rest Al). For the alloy Б 93 (V 93) (6.8-7.8 % Zn, 0.8-1.2 % Cu, 1.7-2.1 % Mg, rest Al) the phase M, and for the alloy Б 93 - 1 (V 93 - 1)(5.0-5.6 % Zn, 0.8-1.2 % Cu, 2.8-3.6 % Mg, rest Al) the phases T, S, and possibly M appear as the stabilizing phases. There are 4 figures and 39 references: 17 Soviet-bloc and 22 non-Soviet-bloc. The four most recent references to English-language publications read as follows: Ref. 9: W. Köster, W. Dullenkopf, J. Metals, 28, 363 (1936); Ref. 10: W.L. Fink, L.A. Willey, TAIMME, 124, 78 (1937); Ref. 11: E. Butchers; G. V. Raynor, W. Hume-Rothery, J. Inst. Met., 69, 209 (1943); Ref. 12: A. T. Little, G. V. Raynor, W. Hume-Rothery, J. Inst. Met., 69, 423 (1943).

SUBMITTED: April 22, 1960
Card 3/3

18.7500

S/129/62/000/004/005/010
E021/E135

AUTHORS: Eskin, G.I., Engineer, and Fridlyander, I.N., Doctor of Technical Sciences, Professor.

TITLE: Crystallization of alloys of aluminium and copper under the effect of ultrasonic vibrations

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no.4, 1962, 32-36 (+ 1 plate)

TEXT: Alloys containing 0, 2, 4, 6, 12 and 33% Cu were used. Melts 50 °C above the liquidus were cast in a chill mold (solidification at 120-150 °C/min) and in a mold of a gypsum-asbestos mixture (10-40 °C/min). The melts were degassed before casting. Ultrasonic vibrations were applied to the melt from below. The frequency was 19-21 kcs, the intensity 18-20 w/cm^2, the amplitude 18 μ; in addition, a piezoelectric device with frequency 800 kcs and an intensity 10-12 w/cm^2 was used. Macro- and micro-sections were examined, the grain size of the alloys and the microhardness were measured. Tensile tests were made and the Cu segregation was determined by spectral photography.

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The most effective action of ultrasonic vibrations occurred on the solid solution type alloy. The vibrations resulted in a finer grain and an increase in tensile strength. At higher Cu contents the effect is less pronounced. The presence of a modifier (0.2% Ti in this case) considerably intensifies the effect. Ultrasonic treatment only slightly affects the copper segregation in the alloys studied; however, it accelerates the diffusion of copper during crystallization of the solid solution. The experiments on pure alloys and alloys containing modifying additions confirmed the theory that the ultrasonic vibrations act by breaking up the solid first formed during solidification. However, the possibility is also put forward that the formation of nucleating crystallites may also be accelerated under the action of the energy given to the melt by the ultrasonic waves or by activation of the impurities. It was also shown that ultrasonic vibrations decreased the interdendritic liquation as a result of acceleration of diffusion of copper in the process of crystallization of the solid solution. Ultrasonic vibrations cause marked changes in the microstructures of the alloys,

Crystallization of alloys of ... S/129/62/000/004/005/010
E021/E135

whereas low-frequency vibrations change only the macrostructure.
There are 6 figures and 1 table.

Card 3/3

S/137/62/000/008/036/065
A006/A101

AUTHORS: Fridlyander, I. N., Zakharov, Ye. D.

TITLE: The effect of manganese upon aging of some aluminum alloys

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 34, abstract 81209 (In collection: "Deformiruyemyye alyumin. splavy", Moscow, Oborongiz, 1961, 113 - 115)

TEXT: The authors investigated the effect of Mn upon kinetics of aging Al-alloys manufactured from grade 00, Cu and Mg-Al. The heat treating conditions were: 1) Holding at 495°C for 1 hour and quenching from this temperature in cold water; 2) aging at 700°C for 2, 4, 8 and 12 hours. The presence of Mn promotes a substantial increase of the strength of the alloys in freshly quenched state. During the aging process the alloys with Mn are strengthened more rapidly and acquire higher σ_b and σ_s values. The addition of Mn to these alloys entails substantial distortions in the crystal lattice of the solid solution, accelerating separation of Cu, Mg and Si out of the oversaturated solid solution.

[Abstracter's note: Complete translation] T. Rumyantseva

Card 1/1

S/839/62/000/000/001/004
E193/E383

AUTHOR: Fridlyander, I.N., Doctor of Technical Sciences

TITLE: Present-day aluminium alloys

SOURCE: Stroitel'nyye konstruktsii iz alyuminiyevykh splavov. Ed. by S.V. Taranovskiy. Moscow, Gosstroyizdat, 1962. 22 - 43

TEXT: This is a review article in which the possibilities and limitations of aluminium alloys as materials of construction and decorative trim in the building and civil-engineering industries are discussed. A short historical survey of the development of aluminium alloys is given in the introductory chapter, which also deals briefly with the theroetical basis of formulating new, industrial, aluminium-base materials. The next chapter is devoted to wrought aluminium alloys, including pure aluminium and alloys of the following systems: Al; Al-Mn; Al-Mg; Al-Mg-Si; Al-Zn-Mg(Cu); Al-Cu-Mg; Al-Mg-Si-Cu; Al-Cu-Mn(Li, Cd). Aluminium cast alloys are discussed next and the last two chapters deal with sintered Al and Al-base alloys and with foamed Al. Typical alloy compositions are given, the effect of heat-treatment (precipitation-hardening) on the mechanical properties and the corrosion-

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S/839/62/000/000/001/004
Present-day aluminium alloys E193/E383

resistance of various alloys is discussed, the weldability of various alloys is assessed and the methods of preparation of some less common materials are briefly described. The paper is general in character but numerical data are frequently given to illustrate the general argument. There are 4 tables.

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S/129/62/000/011/002/007
E193/E383

AUTHORS: Galatskiy, B.D., Engineer and Fridlyander, I.N., Doctor of Technical Sciences, Professor

TITLE: Determination of the heating time during the solution-treatment of extruded duralumin parts

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no. 11, 1962, 13 - 17

TEXT: The mechanical properties of solution-treated and, consequently, of age-hardened duralumin depend on the time at the solution-treatment temperature. The object of the present investigation was to determine the optimum value of this parameter in the heat-treatment of extruded duralumin parts. Analysis of experimental data for extruded rods of alloys Д1 (D1) and Д16 (D16) (with average analysis 4.3% Cu, 0.6 and 1.5% Mg and 0.6% Mn) showed that the heating time, τ_{max}, ensuring the maximum UTS of the alloy, increases with decreasing solution-treatment temperature, t_z, and reduction, λ, attained in extrusion. This relationship is described by

Card 1/4

Determination of ....

$$\tau_{max} = 2\,\frac{510 - t_3}{10} \cdot \frac{10^4}{\lambda^2} \qquad (1)$$

It was found, however, that Eq. (1) was not applicable to extruded shapes, τ_{max} in this case being considerably shorter than that for rods extruded to the same λ. A series of comparative tests was therefore conducted on rods and shapes of the same cross-section, extruded simultaneously to the same λ, through a single multihole die. The results showed that:

$$\frac{\tau^{\circ}_{max}}{\tau^{prof}_{max}} = \frac{P_{prof}}{P_{\circ}} \qquad (2)$$

where τ°_{max} is τ_{max} of a rod, τ^{prof}_{max} is τ_{max} of a profile with the same cross-sectional area and P_{prof}, $P_{\circ}$ denote, respectively, circumference of the rod and profile section. The term "shape coefficient" was ascribed to the ratio:

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Determination of ....

$$\frac{P_{prof}}{P_{\varnothing}} = \varnothing \qquad (2a)$$

and Eq. (1) became:

$$\tau_{max} = 2^{\frac{510-t_3}{10}} \cdot \frac{10^4}{\varnothing \cdot \lambda^2} \qquad (3)$$

where $\varnothing = 1$ for rods and is greater than 1 for other shapes. The results of the next series of experiments showed that τ_{max} depended also on the Cu, Mg and Mn content of the alloy, the effect of Mn being most pronounced. Analysis of the experimental results showed that if the effect of the variation in the Mn content was taken into account, formulae (2) became:

Card 3/4

Determination of ....

$$\tau_{max} = 2^{\frac{\%Mn-0.6}{0.1}} \cdot 2^{\frac{510-t_3}{10}} \cdot \frac{10^4}{\delta \cdot \lambda^2} \qquad (7) .$$

There are 6 figures and 1 table.

Card 4/4

S/123/62/000/023/005/008
A004/A101

AUTHORS: Fridlyander, I. N., Romanova, O. A.

TITLE: The effect of cold working on the mechanical properties of aluminum alloys of different phase composition

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 23, 1962, 17, abstract 23A123 (In collection: "Issled. splavov tsvetn. metallov". 3. Moscow, AN SSSR, 1962, 43 - 47)

TEXT: The authors give an account of the results of investigating the effect of hammer cold working (upsetting) with deformation degrees of 0.5, 10, 15, 20, and 25% both in the freshly hardened state and after a 24-hour aging on the mechanical properties of the Д 16 (D16), АК 4-1 (AK 4-1), АК 8 (AK8) and Д 20 (D20) aluminum alloys. Based on the test data, the following conclusions are drawn. Cold working carried out between hardening and aging increases the strength of the alloys to different degrees. In proportion to the increase in the degree of cold deformation, the strength grows nearly rectilinearly, while the relative elongation drops sharply, particularly with deformations in the range of 5 - 10%. The maximum strength increase by cold working is obtained in

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S/123/62/000/023/005/008
A004/A101

The effect of cold working on the...

forged pieces of the D16 and AK 4-1 alloys, both at room temperature and at 150°C (with 30 minutes and 100 hours holding at the test temperature). With forged pieces from the AK8 and D20 alloys, cold working does not result in a considerable increase in strength during tests at 150°C. The different effect of cold working is caused by the different phase and structural nature of the alloys.

[Abstracter's note: Complete translation]

Card 2/2

FRIDLYANDER, I.N. (Moskva); ROMANOVA, O.A. (Moskva); ARCHAKOVA, Z.N. (Moskva); Prinimali uchastiye: REZNIK, P.G.; LEBEDEVA, N.S.

Mechanical properties of heat-resistant aluminum alloys with lithium and cadmium. Izv.AN SSSR. Otd.tekh.nauk. Met.i topl. no.4:82-89 Jl-Ag '62. (MIRA 15:8)
(Aluminum alloys--Testing)
(Heat-resistant alloys--Testing)

S/806/62/000/003/005/018

AUTHORS: Fridlyander, I.N., Zakharov, Ye.D., Tigina, L.P.

TITLE: The kinetics of the aging of aluminum alloys of the Al-Cu-Mg system.

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledovaniye splavov tsvetnykh metallov, no.3. 1962, 58-61.

TEXT: The paper reports an experimental investigation of the effect of both aging temperature and aging time on the decomposition of a supersaturated, quenched, solid solution in alloys of the Al-Cu-Mg system. The objective of the investigation was to determine the usability of the aging time as an indicator of the time rate of the diffusion flux in an alloy. Four Al-Cu-Mg alloys were tested (compositions tabulated); three of them contained appx. 6.6% Cu+Mg, but in different proportions: 2.1, 1.37, 0.95. The fourth alloy contained also 0.82% Fe, 0.83% Ni, and 0.11% Ti. The alloy was prepared in an electric muffle furnace and cast into a watercooled 280x160x26-mm mold at 680-700°C. The ingots were homogenized for 24 hrs at 480°, milled to 200x150x21 mm, and rolled on a two-roll mill at 420-430°C. First rolling (6-10 passes) reduced the billet thickness to 12-14 mm, second rolling (3-6 passes) to 5-6 mm. Hardness-test specimens were cut, heated in a saltpeter bath to 495°, soaked for 60 min, and water-quenched. This was followed by aging at 160, 180, 200, and 210°C and 30-sec Brinell testing with a load of 1,000 kg on a 10-mm diam ball. The hardness-vs.-aging-time curves show that the solid-solution transformations are accelerated by an increase in aging T; however, the time for

Card 1/2

...figure, 2 tables,
..., 1 German, and 2 English-language).

...TION: None given.

TUMANOV, A.T., glav. red.; VYATKIN, A.Ye., red.; GARBAR, M.I., red.; ZAYMOVSKIY, A.S., red.; KARGIN, V.A., red.; KISHKIN, S.T., red.; KISHKINA-RATNER, S.I., doktor tekhn. nauk, red.; PANSHIN, B.I., kand. tekhn. nauk, red.; ROGOVIN, Z.A., red.; SAZHIN, N.P., red.; SKLYAROV, N.M., doktor tekhn. nauk, red.; FRIDLYANDER, I.N., doktor tekhn. nauk, red.; SHUBNIKOV, A.V., red.; SHCHERBINA, V.V., doktor geol.-miner. nauk, red.; SHRAYBER, D.S., kand. tekhn. nauk, red.; GENEL', S.V., kand. tekhn. nauk, red.; VINOGRADOV, G.V., doktor khoz. nauk, red.; NOVIKOV, A.S., doktor khoz. nauk,red.; KITAYGORODSKIY, I.I., doktor tekhn. nauk, red.; ZHEREBKOV,S.K., kand. tekhn. nauk, red.; BOGATYREV, P.M., kand. tekhn. nauk,red.; SANDOMIRSKIY, D.M., D.M., kand. tekhn. nauk, red.; BUROV, S.V., kand. tekhn. nauk, red.; POTAK, Ya.M., doktor tekhn.nauk, red.; KUKIN, G.N., doktor tekhn. nauk, red.; KOVALEV, A.I., kand.tekhn. nauk, red.; YAMANOV, S.A., kand. tekhn. nauk, red.; SHEFTEL', I.A., kand. khoz. nauk, st. nauchn. red.; BABERTSYAN, A.S., inzh., nauchn. red.; BRAZHNIKOVA, Z.I., nauchn. red.; KALININA, Ye.M., mlad. red.; SOKOLOVA, V.G., red.-bibliograf; ZENTSEL'SKAYA, Ch.A., tekhn. red.

[Building materials; an encyclopedia of modern technology] Konstruktsionnye materialy; entsiklopediia sovremennoi tekhniki. Glav. red. A.T.Tumanov. Moskva, Sovetskaia entsiklopediia. Vol.1. Abliatsiia - korroziia. 1963. 416 p. (MIRA 17:3)

1. Chlen-korrespondent AN SSSR (for Kishkin).

ACCESSION NR: AT4012706 S/2981/63/000/002/0005/0012

AUTHOR: Matveyev, B.I.; Fridlyander, I.N.; Agarkov, G.D.; Stepanova, M.G.; Vlasova, P.T.

TITLE: Properties and application of blanks made of sintered aluminum powder (SAP)

SOURCE: Alyuminiyevy*ye splavy*. Sbornik statey, no. 2. Spechenny*ye splavy*. Moscow, 1963, 5-12

TOPIC TAGS: powder metallurgy, aluminum powder, sintered powder, sintered aluminum powder, SAP, SAP blank

ABSTRACT: In a general review of the uses and properties of SAP, it is pointed out that heat-resistant deformed alloys of sintered aluminum powder at 350-500C are significantly stronger than standard deformed aluminum alloys. This is explained by the finely dispersed oxide phase uniformly distributed in the aluminum matrix. Parts made of SAP, whether from APS-1 or APS-2 powder, show corrosion resistance practically equal to that of ordinary aluminum. The technology of the briquetting, sintering and pressing of SAP is described. The following blanks are commonly made of SAP-1: rods and pipes up to 200 mm in diameter, sections up to 100 sq. cm and over, sheets 900 mm wide, up to 3 m in length

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ACCESSION NR: AT4012706

and up to 0.8 mm thick, rivet wires, foil up to 0.03 mm thick, pressed blanks. SAP-2 is used for parts of the same type, only of lower workability. The fatigue strength of both SAP-1 and SAP-2 exceeds that of all aluminum alloys. Some representative data are tabulated. These metals may be soldered and welded, machined, finished, cut and pressed. The wall thickness and radii of the tubes which can be pressed from SAP are smaller, the lower the content of Al_2O_3 in the initial material. These features show that the existing opinion concerning the brittleness of sintered materials has nothing to do with SAP. It can be machined in the same way as common aluminum, and new fields of application are constantly opening. "The corrosion tests were carried out by V.S. Komissarova." Orig. art. has: 3 figures and 6 tables

ASSOCIATION: None

SUBMITTED: 00 DATE ACQ: 13Feb64 ENCL: 00

SUB CODE: MM NO REF SOV: 000 OTHER: 000

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L 24127-65 EPF(n)-2/EPR/EWT(m)/EWP(b)/EWP(t) Ps-4/Pu-4/Pad IJP(c)
WW/JD/HW/JG
ACCESSION NR: AT4012728 S/2981/63/000/002/0160/0168

AUTHOR: Fridlyander, I. N.; Kiyagina, N. S.; Krivenko, R. A.

TITLE: Silicon-aluminum alloy with a low coefficient of linear expansion

SOURCE: Alyuminiyevyye splavy*. Sbornik statey, no. 2. Spechenny*ye splavy*. Moscow, 1963, 160-168

TOPIC TAGS: aluminum alloy, silicon alloy, silicon aluminum alloy, SAS, linear expansion coefficient, alloy linear expansion, alloy plasticity, iron containing alloy, nickel containing alloy, zirconium containing alloy, titanium containing alloy, silicon carbide

ABSTRACT: Binary aluminum-silicon alloys (4-32% Si) and those with admixtures of Fe (up to 9%), Ni(5-17%), Zr(2.5%), Ti(up to 16%), and SiC(10 and 20%) were prepared by pulverizing and grinding processes and were tested for strength and linear expansion. The highest strength was exhibited by Al-Si alloys of close-to-eutectic composition (25-30%), their plasticity decreasing as the Si content increased. Additions of Ni had a more favorable effect than additions of Fe. The best mechanical properties were obtained with additions of 5-7% Ni, while additions of Zn produced no appreciable effect. Additions of SiC produced quality

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ACCESSION NR: AT4012728

alloys, and additions of Ti produced markedly greater strength in alloys prepared by pulverizing. The lowest coefficient of linear expansion was obtained with additions of Ni. Additions of Ti were found to have a greater lowering effect then additions of Si. Alloys composed of Al, Si, and SiC possess high mechanical properties and exhibit a low coefficient of linear expansion, which decreases as the SiC content increases. The processes of preparing the alloys and examining their microstructure are given and discussed at great length. Orig. art. has: 2 tables, 4 figures and 5 graphs.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00

SUB CODE: MM NO REF SOV: 001 OTHER: 002

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